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The Reindeer (Caribou in N. America)

The members of genus *Rangifer* differ from other members of the deer family (Cervidae) in that both females as well as males bear antlers. Though much loved for their seasonal appeal, their use 'like Christmas decorations' in live displays has been criticized by the RSPCA and the British Veterinary Association. Reindeer are highly adapted to life in the Arctic but can be at much greater risk of health problems in warmer climates, especially in confined and noisy spaces.

Daily Telegraph report, 18 Dec 2019 . Picture: www.stockphotosecrets.com

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St Thomas Aquinas **St Bonaventure**
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To inform Catholics and others of the scientific evidence supporting Special Creation as opposed to Evolution, and to show that the true discoveries of Science are in conformity with Catholic doctrines on Origins.

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Editor & Secretary: Anthony Nevard
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EDITORIAL

Cattle and Sheep – beloved of God and man

According to tradition, it was St Francis of Assisi who first thought of representing the Nativity scene as a tableau and who constructed the first ‘crib.’ When visiting Rome in 1223, he told Pope Honorius of his plans and the Pope gave his blessing. When the scene was set up in Greccio at Christmas, the figures included, of course, Our Lady and St Joseph, with the shepherds, the ox and the ass. In mid-September the following year, about the feast of the Exultation of the Cross, St Francis was favoured with the extraordinary grace of the stigmata, later to be witnessed by several people while he was alive, and by multitudes after his death on 4th October 1226.

The seasonal images we recall each Christmas always include shepherds, implying also sheep and lambs, to whom the angels brought “good tidings of great joy” (Lk 2:10). The Gospel text tells of the Infant “lying in the manger” (Lk 2:16) but makes no explicit mention of stable, ox or ass. Logically, the manger provided food (hay) for animals; the sheep (and any goats) were out in the fields, so the other domesticated animals in Palestine would be ‘cattle,’ which would also include oxen, used mainly for ploughing the land, and asses, for carrying loads or people. These are still the most useful types of creatures to mankind worldwide.

It would take several pages to quote all the references to sheep and oxen in the Bible. *Cruden’s Concordance* lists at least 85 for ‘ox’ or ‘oxen’, 90 for ‘sheep’ and 60 for ‘shepherd(s)’ [1] In Genesis, ‘cattle’ are the first creatures named that God created on the earth (Gen. 1:24) and that Adam named (Gen. 2: 20), though the term was probably equivalent to what we might call ‘large domesticated mammals’. After the Fall, “the Lord God made for Adam and his wife garments of skins, and clothed them” (Gen. 3:21). It seems likely that two sheep were slain, showing God the Creator of life also has the power and right to take it away. This gave an example of sacrifice that was to be followed in the future, for example when Abel, the shepherd, offered the “firstlings of his flock.” (Gen. 4:4). Seven pairs of ‘clean beasts’ were taken on the Ark (Gen. 7:2), which provided for sacrifice to the Lord after the Flood (Gen. 8:20). And so it continued, throughout Old Testament times, that the even-toed cattle, oxen, calves, sheep, lambs, goats and kids were to play a key part not only in the economy of the chosen people but in their spiritual and religious activities.

Consideration of the role that this group of creatures, the Bovidae family, play in the world readily leads to the conclusion that they were created primarily to provide for man’s needs in converting grass, which we cannot digest, to both nourishment as milk and meat as well as materials as wool, hair, hide, leather, bone and horn. This is even recognized by secular zoologists like J.Z. Young:

> “Thus there is very great variety of life and structure in the modern bovids, and one of the most striking conclusions about the group is that the specialists have not yet succeeded in finding an agreed system of classification. More important perhaps than these problems is the fact that with their fine cropping mechanism, grinding battery and stomach the bovids provide the only satisfactory intermediary by which

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[1] Eadie, J. (Ed.), *A New and Complete Concordance to the Holy Scriptures, on the Basis of Cruden*, (36th edn., 1875), Charles Griffin &Co, pp. 340, 429.

> grass can be used as a contributor to human life. This, with their peaceful and gregarious disposition, has made them our most important commensal. If there were no Bovidae there would be fewer human beings in the world, and our social organization would be very different.” [2]

In this issue, we survey this group of mammals that share the distinction of bearing paired horns. Darwinists have failed to agree about how these 140 living species and 300 extinct species are connected. The fact that it has been possible to selectively breed many distinct varieties of sheep and cattle adds weight to the biblical argument that these creatures were specially created, with the potential for us to ‘create’ breeds ideally suited to different environments, conditions and uses.

St John Henry Newman and Miracles

Cardinal Newman (1801-1890) was an English theologian and Anglican cleric who converted in 1845 and eventually became cardinal in 1879. He was canonized on 13 October 2019. This article contrasts the Catholic attitude to miracles with the Protestant one that Newman saw as represented by Kingsley. In fairness, there may well be many non-Catholic Christians nowadays whose philosophy on this subject comes closer to the Catholic one. However, if they believe in Divine intervention at Lourdes and Fatima, the image of Christ on the Shroud, and that of Our Lady on Juan Diego’s *tilma* at Guadalupe, they should surely become Catholics.

John Ray – ‘the most important British natural scientist to date.’

The John Ray Trust (www.johnraytrust.com) nominates their patron (1627-1705) in such glowing terms, without even the qualification ‘after Darwin!’ On belatedly reading his life story, I now appreciate that his contribution has been much overlooked. Though he refused to accept the Act of Uniformity, it seems he retained his Christian faith and achieved greatness in science, despite not espousing an evolutionary philosophy. Credit to him for that!

Thanks and apologies

I regret that, partly owing to illness and the death of a family member, this issue is late again. I am very grateful to you for renewals of subscriptions, donations, encouragement and prayers; I’m afraid I cannot acknowledge them all, but if you have updated your sub., please check that your expiry date on the next address label has moved forward. Depending on the next postal rate changes, it may be necessary to increase the sub later this year. *A.N.*

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[2] Young, J.Z., *The Life of Vertebrates*, Oxford University Press (1962), p.764.

The Dilemma of the Horns [1]

Anthony Nevard

Among the vast array of anatomical features found in mammals, the presence or absence of horns is one of the most notable – either to the sense of sight or perhaps, in unlucky circumstances, to those of touch and pain! A horn is a "defensive or offensive structure that grows from the head of some mammals."[2] While the word has been applied to certain other natural structures, such as the stag's horn beetle or the stink-horn fungus, we shall only consider here those with the conventional meaning. These include the horns of cattle, sheep and antelopes, as well those of the rhinoceros and the antlers of deer. In most of these species, the typical horn has a bony core covered by the skin protein keratin, and they are retained for life. However, the rhinoceros horn is not bony but entirely made of keratin, essentially as compressed hair. The rhino is not closely related to the other horned kinds, as we shall see later. The antlers of deer are not permanent and are shed and replaced annually. The shapes, sizes and curvature of horns are very varied, and may be entirely absent in the female of the species. The variety and specialism of horns in nature provide further evidence of design (see illustrations on back cover).

The alternative evolutionary hypothesis lacks the evidence of hard scientific facts. According to Darwin's theory:

1. these structures must have all evolved from ancestral forms in which they were originally non-existent;
2. they must have developed through numerous transitional forms, each slightly better adapted for survival and reproduction;
3. these hypothetical intermediate forms, if not evident in currently living species, must have become extinct, and it would be reasonable to expect to discover at least some of them in the fossil record.

We shall review the data from living and extinct horned mammals and consider if they fit better with an evolution or creation-based origins scenario.

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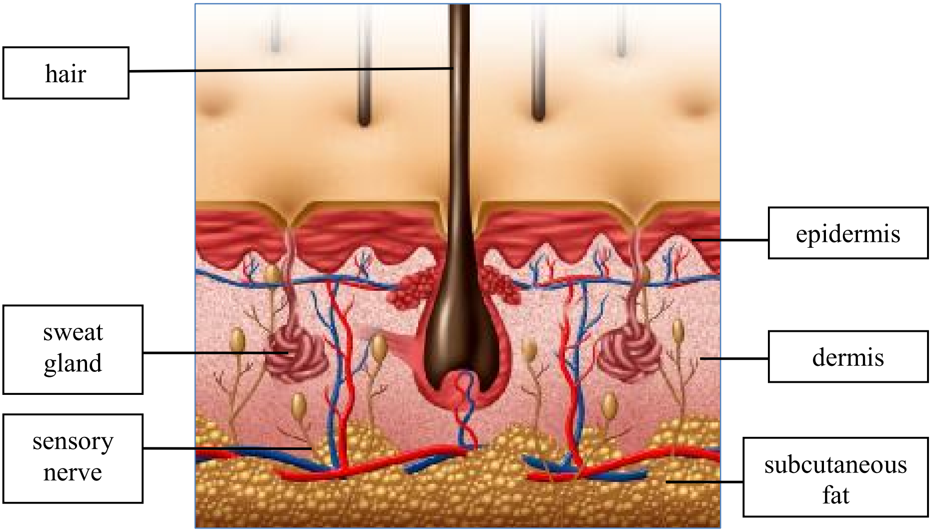
[1] The English phrase "the horns of a dilemma" means being faced with deciding between two alternatives, both being undesirable or unpleasant.

[2] Luck, S. (Ed.), *Philips Science and Technology Encyclopaedia*, George Philip Ltd. (1998), p. 181.

Since the characteristics of horns are clearly inheritable, we should expect significant differences in the relevant DNA of the various species, together with their other distinctive features, which demonstrates their phylogenetic connections. The nature and distribution of horns is not random among mammals but associated with particular ruminant families: deer, giraffes, cattle, goats, sheep. They are not found in pigs, hippopotamuses, camels or horses (apart from the mythological unicorn, of course!) Fossil skulls may also display various shapes and sizes of horn, more of less similar to living types, but without clear connections between groups. There is no evidence for an ancestral 'proto-horned' creature or scientific agreement on the evolutionary pathways supposedly radiating out over millions of years to create the varieties of horned beasts commonly found today. The very existence of horns is another problem which evolution fails to explain.

The skin: a marvel and a mystery in itself

This diagram shows some of the structures in mammalian skin, from which the outer layer of the horn is a modification. The skin forms the essential boundary between our living apparatus within and the often-hostile environment without – too wet, too dry, too cold, too hot. But we cannot survive by shutting ourselves within an impermeable shell: we depend on the external world for food, oxygen, water, removal of wastes. We need to be aware of our habitat to



find food and avoid being eaten, to seek safety and avoid dangers. This in effect creates a ‘conflict of interests’ in terms of skin design:

> The same skin which protects the animal against external conditions must also inform it about these in order that it may survive. Skin is therefore in the paradoxical condition of being the organ which isolates animal from environment and at the same time the organ which binds animal to environment. It must perform both roles simultaneously and must not let efficiency in the one impair efficiency in the other. [3]

For such reasons, our skin typically has a tough surface layer (epidermis) of dead cells containing the protein keratin, but flexible and elastic enough to allow bending of joints and opening of the mouth. Pores allow sweat to escape and help cooling in hot conditions. The inner dermis includes nerves to facilitate sensitivity (e.g. to temperature changes, touch, pressure and pain), blood vessels to supply fluids and nutrients, muscles and fat cells to help temperature control, even a layer of melanin to protect against excessive UV radiation. The proportions of these components vary in different parts of the body (e.g. lips, fingertips, soles of the feet). Rupture of the integrity of the skin can put the whole body in danger from blood loss and ingress of infection.

Claws and fur

Parts of our fingers and toes have, as it were, sacrificed some of these functions for a greater benefit – protection. Our fingernails also support the very sensitive pads on our fingertips, and allow for scratching. We frequently see this benefit in our pets using their claws. In most of the cat family, these highly keratinised organs have muscles allowing for extension and withdrawal, reducing wear and keeping them sharp for defence or aggression. In the hoofed mammals the ‘nails’ are highly modified to protect the sole of the foot. In others such as the anteater, the claws are strongly developed for digging. Birds and most reptiles, though different vertebrate orders from mammals, also have well-developed claws. As with horns, their size and weight need to be in an appropriate proportion to the animal’s body and strength, and its practical needs.

In most mammals, the major depository of keratin is their hair or fur, and in birds it is their feathers. Again, the texture, density, length and colour of the fur are very varied, and may contribute to protection, temperature control, providing camouflage and intra-specific recognition signals through size, colour, patterning and movements.

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[3] Graham, A., Introduction, *Comparative Biology of Skin*, Spearman, R.I.C. (Ed.), Academic Press (1977), pp.1-2.

Horn distribution among mammalian families

Firstly, a brief simplified review of animal classification. In this context, ‘family’ refers to a classification group, following the system established by Carl Linnaeus (1758). Putting this in basic terms, kinds of organism that freely interbred with their own kind belong to the same **species**; similar species (which might rarely cross with other species) belong to the same **genus** (pl. genera). Each species is given a double Latin name: the first word is the generic name, the second is the specific name. Similar genera are grouped into **families**, families into **orders**, orders into **classes**, and classes into a **phylum** (pl., phyla). The common body plan of members of the Animal Kingdom which possess a backbone places them into the Phylum Vertebrata (Chordata). Mammals comprise one of the five classes of vertebrates.

Of the placental mammals, only two orders include members with horns: the **perissodactyla** (odd-toed) and the **artiodactyla** (even-toed). The diagram below shows the supposed evolutionary ‘family tree’ of the orders of placental mammals (arrows indicate these two orders). The thickness of the branches gives a rough indication of the abundance of the various groups.[4]

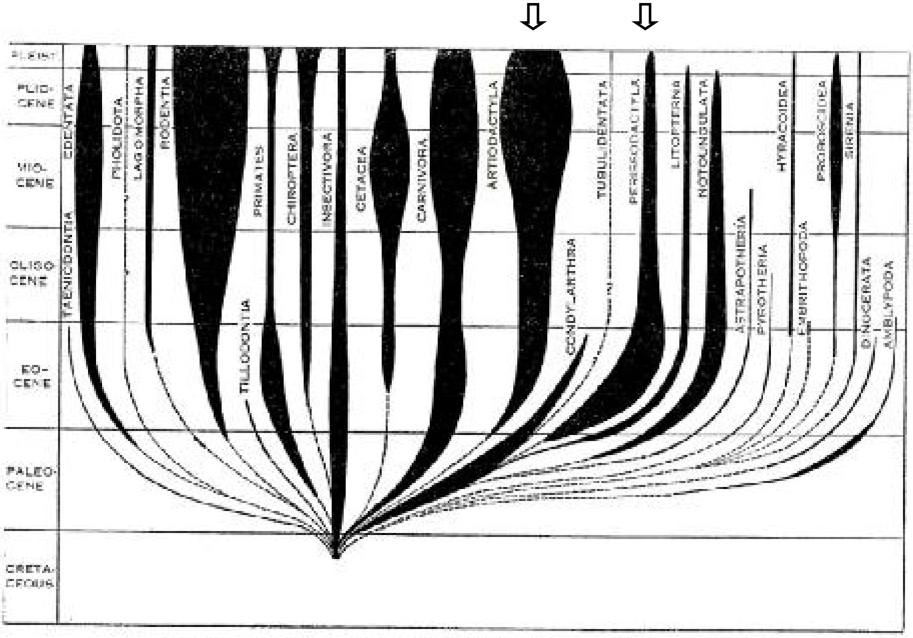

FIG. 257.—The chronologic distribution of the placental mammals

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[4] Romer, A.S., *Vertebrate Palaeontology*, University of Chicago Press (2^{nd} Edn), 1945, p. 325.

The dashed lines on the diagram indicate the hypothetical pathways of transitional forms that ‘must have existed’ but of which there is no trace of fossil evidence! One notes that despite the curved lines focusing into the Cretaceous Period, there is nothing to suggest any links between them. All of this diversification, which would also include aardvarks to whales and buffaloes to bats, is supposed to have happened within a ten million year time span! Admittedly, the diagram is taken from a book of the mid 20th century, but here is a recent quotation from a website illustrating similar conjectural claims:

> The Paleocene Epoch spans the time between roughly 65 million years ago (mya) and 55 mya. […]
>
> The Paleocene Epoch marks the rise of mammals as the dominant land species. During the Paleocene Epoch, climatic moderations reduced the evolutionary pressure of extreme swings in climate. Although a diversity of mammals had evolved and widely populated the changing continental land-masses long before the Paleocene Epoch, the reduction in predator species allowed land mammals to dominate and thrive—eventually setting the stage from the evolution of homo sapiens (humans). [5]

Rhinoceros horns – non-homologous to other horns

The odd-toed ungulates (hoofed animals) include horses, zebras, tapirs and rhinos. The classification of these herbivores is dependent on the fact that the weight of the body is carried mainly by the third toe of each limb (a mesaxonic foot, based on the common plan of the vertebrate pentadactyl limb). Across the range of living and fossil species there is considerable fusion of limb bones and a reduction of digits, from which a supposed sequence of evolutionary steps leading up to modern horses has been devised. Despite being widely touted as solid fossil evidence for evolution, this is in fact very controversial even among palaeontologists. It serves as a smokescreen and distraction from the numerous other claims for which there is neither fossil evidence nor a plausible evolutionary hypothesis. [6]

There is, of course, ample evidence that living forms of the horse family can interbreed, including zebras and donkeys, though they may have different numbers of chromosomes (e.g. horse 64, Grevy zebra 46). However, the offspring are usually infertile. The rhino’s nearest relatives are tapirs, which were once much more widely distributed than nowadays. Their fossil remains:

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[5] https://www.encyclopedia.com/earth-and-environment/geology-and-oceanography/geology-and-oceanography/paleocene-epoch

[6] An excellent critique of the horse supposed lineage appears in Sodera, Dr. V., *One Small Speck to Man*, Vija Sodera Productions, (2nd Edn.) 2009, pp 86-93. www.onesmallspeck.com

> “ show that tapirs have remained almost unchanged for many millions of years; the modern species look very much the same as their ancestors must have done.” [7]

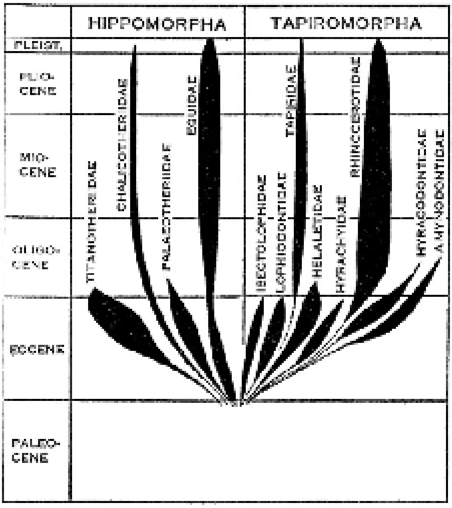

FIG. 318.—The phylogeny of the perissodactyls

The diagram [8] confirms the statement that the Tapiridae family, like the Rhinocerotidae, have no known common ancestor. Once again, the facts do not support an evolutionary scenario. Yet the great Harvard Professor Alfred Romer avers that,

> “Among all vertebrates there is, perhaps, no group whose fossil history is better known than that of the order Perissodactyla.” [9]

Tapirs have a similar body shape to rhinos but are considerably smaller, lack a horn, and are well covered with a coat of hair. In contrast, the African square-lipped rhinoceros is the largest living land mammal, after the elephant.

> “The skin is characteristically thick and has little hair. The horns are composed entirely of hair-like growths set above thickenings of the nasal bone and (in two-horned species) the frontal bones. They are not attached to the skull, and may even be torn off in fighting; when this happens they quickly grow again.” [10]

Fossil rhinoceroses “in the Tertiary … were exceedingly numerous in the northern continents.” Since “the matted hair of the “horn” fossilizes in relatively few cases … our evidence for the presence of a horn usually consists of a roughened area on the skull for its attachment.” [11] The extinct woolly rhinoceros (*Coelodonta*) has been found in permafrost and was the subject of European cave art (e.g. Lascaux in France).

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[7] George W. et al, *The Illustrated Encyclopaedia of Plants and Animals*, Marshall Cavendish (1979), p. 248.

[8] Romer, *op. cit.*, p. 421.

[9] Romer, op. cit., p. 420

[10] George, *op.cit.,* p. 249.

[11] Romer, *op.cit.,* pp.345,438.

A cornucopia of keratin in the artiodactyla

It is among the even-toed ungulates that we find a rich range of true horns – but their distribution is again uneven across the order. This taxon includes cattle, sheep and deer, typically horned, and pigs, camels and hippopotami, with none. Their classification is chiefly based on their toe arrangement, with the axis of balance between the third and fourth toes (a paraxonic foot). These toes are equal in size and bear hooves (the cloven hoof), with other digits reduced.

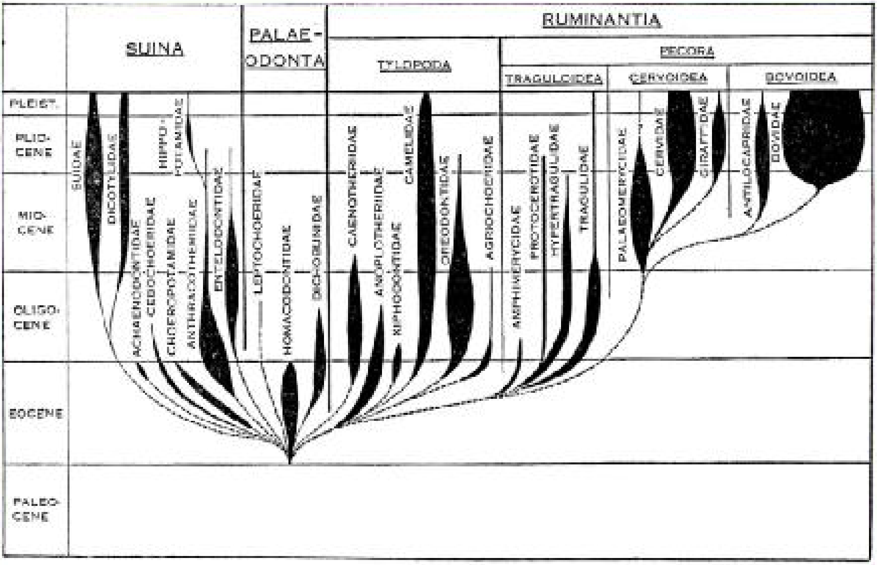

FIG. 334.—Provisional phylogeny of the artiodactyl groups

Again, this diagram [12] of the hypothetical interconnections between families includes a majority which have no living descendants, and nothing to link any of them in evolutionary terms beyond apparent resemblances, sheer conjecture, and blind faith. The living artiodactyls are straightforward to classify, based mainly on teeth, and comprise: (1) the suborder Suina: pigs, peccaries and hippopotami; (2) the suborder Ruminantia (cud-chewers), which include (a) the Tylopoda, or camels, and (b) the Pecora, the deer-giraffe-antelope-cattle group. However, according to Romer:

> "But when the fossil forms are included, such an easy separation is impossible; we are confronted with a large array of families which are intermediate in many

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[12] Romer, *op. cit.*, p.443.

> respects between existing types or belong to extinct side branches. The various classifications that have been made vary greatly. This reflects the fact that in the early artiodactyls the features of teeth, skull, and feet which are useful in distinguishing the two major existing groups were present in variable and confusing combinations." [13]

This comment overlooks the fact that the fossilised bones do not provide any direct evidence of the extinct animals' skin or inner soft parts, nor of features that might vary within the limits of a breeding population. Just as in modern types, a two-year old child can distinguish a tiger from a lion, but it takes an expert to tell their skeletons apart. If we were to find fossilised bones of a Pekinese and a Great Dane, would we be likely to place them in the same species without knowing from living forms that they could interbreed?

The similarities, differences and relationships between animal kinds have of course long been recognised, and one of the most detailed descriptions has come down to us in Aristotle's *History of Animals*, written in the 4th century BC. The philosopher made use of numerous Latin and Greek authorities, and probably other sources no longer available. The Mosaic law provides detailed distinctions between clean and unclean, of animals that chew the cud or have a divided hoof (e.g. Deuteronomy 14: 1-20). While not claiming Aristotle's text to be inerrant, it may be of interest to quote a few lines on this subject:

> "Some animals have horns, others have none; most of those with horns have also cloven feet, as the ox, the stag, and the goat. We have never seen an animal with a solid hoof with two horns, and there are only a few that have a solid hoof and one horn, as the Indian ass, [14] and the oryx.
>
> All animals with horns are four-footed […] The stag is the only animal that has solid horns, the horns of all other animals are hollow for a part of their length, and solid at the extremity; the hollow part is principally formed of skin, and round this is arranged the solid part, as in the horns of oxen. The stag is the only animal which casts its horns; they are reproduced; this takes place every year after the animal has attained the age of two years; other animals never lose their horns unless destroyed by violence." [15]

Aristotle classified about 500 animals in a hierarchy, or *scala naturae*, with man at the top, and saw nature as an expression of purposeful design, not as an evolutionary process. In a detailed article on 'Wikipedia' we read:

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[13] Romer, *op.cit.*, p. 445-446.

[14] Study of photos of the Indian ass suggest that the peak of its mane between the ears might have been misinterpreted by ancient observers as a form of horn. [Ed.]

[15] Aristotle, *The History of Animals*, tr. R. Cresswell, Henry Bohn (1862), Book 2, Ch. II, paras. 8 & 10.

Aristotle’s writings can seem to modern readers close to implying evolution, but while Aristotle was aware that new mutations or hybridisations could occur, he saw these as rare accidents. For Aristotle, accidents, like heat waves in winter, must be considered distinct from natural causes. He was thus critical of Empedocles’s materialist theory of a “survival of the fittest” origin of living things and their organs, and ridiculed the idea that accidents could lead to orderly results. To put his views into modern terms, he nowhere says that different species can have a common ancestor, or that one kind can change into another, or that kinds can become extinct. [16]

Skulls of extinct Pecora

(Not to scale)

These examples illustrate some of the variety of horned and hornless skulls found in this group.

Note the absence of upper incisor teeth and the gap (diastema) in front of the premolars, facilitating their herbivorous diet.

[Romer, *op.cit.,* p.466].

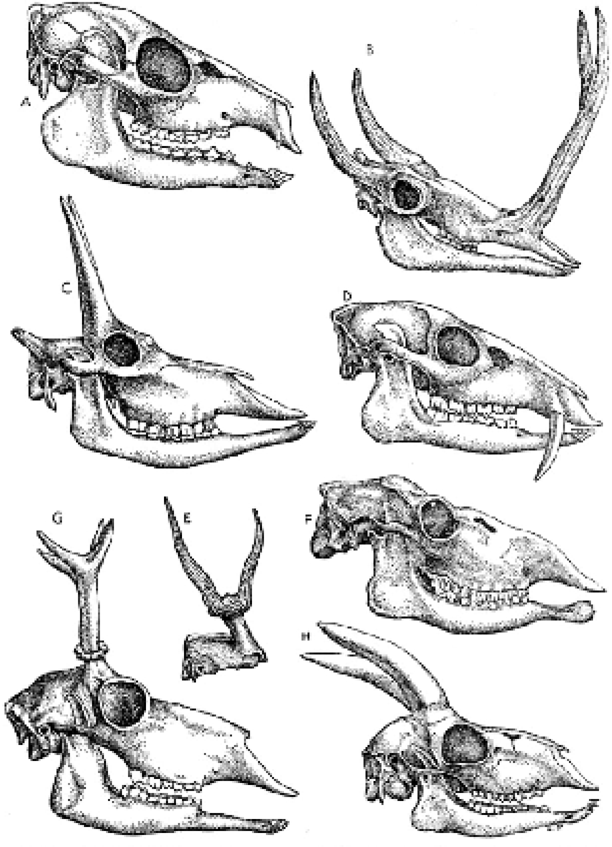

FIG. 362. Skulls of pecorans. *A*, *Leptomeryx*, a primitive American Oligocene hypertragulid, skull length about 4½ inches; *B*, *Synthetoceras*, a grotesque American Pliocene protoceratid, skull length about 18 inches; *C*, *Samotherium*, a Pliocene giraffe (a male; the "horns" shorter in the female), skull length about 2 feet; *D*, *Parablastomeryx*, a Miocene hornless palaeomerycid, skull length about 14 inches; *E*, horns of *Dicroceros*, a European late Miocene cervid; *F*, female of *Megaceros*, the "Irish elk," skull length 20 inches; *G*, *Merycodus*, a Miocene antilocaprid, skull length about 7 inches; *H*, *Gazella brevicornis*, a Pliocene antelope, skull length about 6 inches. (*A*, *D*, *G* after Matthew; *B* after Stirton; *C* after Bohlin; *E*, *H* after Gaudry; *F* after Owen.)

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[16] https://en.wikipedia.org/wiki/Aristotle#Empirical_research

Family Cervidae (deer)

The males of this group usually possess branching appendages on the crown of the head called antlers. The branches are called tines. In reindeer and caribou, females also bear antlers. They are shed annually and arise afresh from skin-covered bony knobs that grow rapidly into antlers, covered in soft ‘velvet.’ A prominent ring of bone then forms at the base of the antler which constrict blood flow, so the velvet dries up and gradually gets rubbed off. More mature animals usually grow larger antlers with more branches.

The Musk-deer (*Moschus*) is unique in possessing a gall-bladder and, in males, an abdominal scented musk gland. They have no antlers but have greatly enlarged canine teeth for defence and fighting. Other members of the family include the spotted Fallow-deer, the Irish elk (Megaceros), now extinct, which stood six feet at the shoulder and carried antlers exceeding eleven feet in spread. The Moose of North America and the Elk of Northern Europe are the largest members of the deer family. However, the Chevrotains (Mouse-deer) lack horns or antlers, have only three chambers in the stomach, and are only about 12 inches high.

Family Bovidae (oxen, sheep, goats and antelopes)

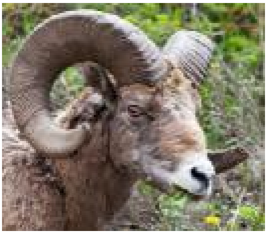
This family includes all the hollow-horned ruminants in which the horns are hollow sheaths investing bony cores; both the core and the horn are permanent and are not shed annually. In wild species, males always bear horns, and in many cases the females do also. A few examples here can serve to illustrate considerable variety in the shapes and sizes of the horns.

One of the sixteen sub-families is the **Bovinae**, including oxen and other cattle. These are usually large in size, and horns are present in both sexes. They are related to the extinct Aurochs, or Wild-ox of Europe. The genus *Bubalus* are the buffaloes [as illustrated], with massive horns, triangular in cross-section.

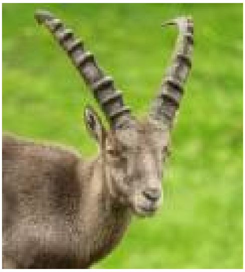
In contrast to buffaloes, the genus *Bison* [illustrated], found in Europe and America, have much smaller horns, rounded in cross-section. They once roamed over a vast extent of North America, and have often (confusingly) been referred to as buffaloes.

Other genera of this sub-family include *Bibos*, which contains the Gaur, which has massive curved horns, and the Banteng, with more slender horns. The Yak of Tibet, *Poëphagus*, has very long horns and a long coat. As with other cattle, these creatures have been much valued by man as a source of meat, milk, leather and horn, as well as their use as beasts of burden and draught animals.

Among domestic cattle, this Highland variety is most similar to their auroch ancestor. Selective breeding, especially during and since the eighteenth century, has led to much more efficient milk and meat production. Recent genome editing is being used to develop naturally hornless cattle that should be less prone to injury.



The second horned sub-family is the **Caprinae**, containing sheep, goats, ibexes, markhors and tahrs. They are smaller in size than oxen; both sexes bear horns, which are marked with transverse ridges, and are usually in the form of an open spiral, though some are formed like a scimitar.



Sheep and goats, of course, have been extensively domesticated and are common worldwide. There are more than 200 distinct types of sheep and goats, prized for their wool and meat. Their horns provide defence but are also deployed in clashes between rams. Blowing the ram’s horn trumpet (*shofar*) is cited about 50 times in the Old Testament. The examples of goats illustrated here show distinctive horn shapes. [17]

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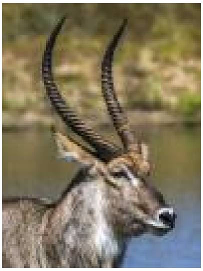
[17] Animal pictures in this article taken from www.stockphotosecrets.com

There are about 100 species of **Antelopes** living today, mostly in Africa and Asia, and they are distinguished from deer by having unbranched, permanent horns, found in both sexes. Their horns have a bony core covered with a keratin sheath, while antlers are solid bone. They are perhaps the most graceful and beautiful of the artiodactyla, ranging in size from the 10-inch high ‘royal antelope,’ *Neotragus pygmaeus*, to the giant eland, *Taurotragus oryx*, 6 ft high at the shoulder. Others include gazelles, gnus, and the oryx.



While there are many other physical differences among them, the horns are key distinguishing features:

> The horns of an antelope often provide a good way of identifying the species: they may be short and conical, long and straight, twisted like a screw, lyre-shaped or sickle-shaped. They never form the tight curl of rams’ horns. [18]

This picture shows the waterbuck, *Kobus ellipsiprymnus.*

Finally, we need to consider the lofty family **Giraffidae**, now only surviving as the giraffe, up to nearly 20 ft tall, and the rarer okapi, about 6 feet high. The horns of the giraffe are permanent and covered with skin and hair. Unusually, their bony part develops separately from the skull, and joins to it as the animal matures. Some individuals may have up to three extra bony protruberances. In the okapis, only males have such short horns. Rather similar extinct fossil types such as *Samotherium* and *Palaeotragus*, without the very long legs and neck, had earlier been found in Europe and Asia. The discovery of okapis in central Africa in the early 1900s was “of great interest,” writes Romer, as it appeared “almost indistinguishable from such ancestral Tertiary types;” in other words, not ancestors of giraffes. [19]

In Romer’s textbook, on the even-toed ungulates, we can read such phrases as: “it is obvious that the ancestral forms must have…” [p.444]; “…seemingly the most primitive…” [p.446]; “…their history is uncertain…” [p.453]; “…we have in the bovoids no basal stock…there are no connecting forms…” [p. 470]. There is no evidence that explains how or why paired horns of such variety should have evolved exclusively in this group, but much to support belief in, and praise for, the loving Creator Who brought into existence this order of creatures, of such economic, ecological and aesthetic value to mankind.

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[18] George, W., op.cit., p.277.

[19] Romer, op.cit., p.470

ST JOHN HENRY NEWMAN ON MIRACLES

From *APOLOGIA PRO VITA SUA* [1]

Answer in Detail to Mr. Kingsley's Accusations

Ecclesiastical miracles

These words of mine, however, are but one sentence in a long argument, conveying the Catholic view on the subject of ecclesiastical miracles. […] The argument, I should first observe, which is worked out, is this, that Catholics set out with a definite religious tenet as a first principle, and Protestants with a contrary one, and that on this account it comes to pass that miracles are credible to Catholics and incredible to Protestants.

We affirm that the Supreme Being has wrought miracles on earth ever since the time of the Apostles; Protestants deny it. Why do we affirm, why do they deny? We affirm it on a first principle, they deny it on a first principle; and on either side the first principle is made to be decisive of the question ... Both they and we start with the miracles of the Apostles; and then their first principle or presumption against our miracles is this, 'What God did once, He is *not* likely to do again;' while our first principle or presumption for our miracles is this; 'What God did once, He *is* likely to do again.' They say, It cannot be supposed He will work *many* miracles; we, It cannot be supposed He will work *few*.

The Protestant, I say, laughs at the very idea of miracles or supernatural powers as occurring at this day; his first principle is rooted in him; he repels from him the idea of miracles; he laughs at the notion of evidence; one is just as likely as another; they are all false. Why? because of his first principle, There are no miracles since the Apostles. Here, indeed, is a short and easy way of getting rid of the whole subject, not by reason, but by a first principle which he calls

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[1] *A defence of one's own life* is John Henry Newman's defence of his religious opinions, published in 1864 in response to Charles Kingsley (author of *The Water Babies*) of the Church of England after Newman quit his position as the Anglican vicar of St. Mary's, Oxford.

Published by J. M. Dent & Sons Ltd.(London) and E.P. Dutton & Co. (New York). Punctuation style retained as in original text.

This text taken under Project Gutenberg Licence: http://www.gutenberg.org/files/19690/19690-h/19690-h.htm reason. Yes, it *is* reason, granting his first principle is true; it is not reason, supposing his first principle is false.

There is in the Church a vast tradition and testimony about miracles; how is it to be accounted for? If miracles *can* take place, then the *fact* of the miracle will be a natural explanation of the *report*, just as the fact of a man dying accounts satisfactorily for the news that he is dead; but the Protestant cannot so explain it, because he thinks miracles cannot take place; so he is necessarily driven, by way of accounting for the report of them, to impute that report to fraud. He cannot help himself. I repeat it; the whole mass of accusations which Protestants bring against us under this head, Catholic credulity, imposture, pious frauds, hypocrisy, priestcraft, this vast and varied superstructure of imputation, you see, all rests on an assumption, on an opinion of theirs, for which they offer no kind of proof. What then, in fact, do they say more than this, *If* Protestantism be true, you Catholics are a most awful set of knaves? Here, at least, is a most sensible and undeniable position.

Now, on the other hand, let me take our own side of the question, and consider how we ourselves stand relatively to the charge made against us. Catholics, then, hold the mystery of the Incarnation; and the Incarnation is the most stupendous event which ever can take place on earth; and after it and henceforth, I do not see how we can scruple at any miracle on the mere ground of its being unlikely to happen.... When we start with assuming that miracles are not unlikely, we are putting forth a position which lies embedded, as it were, and involved in the great revealed fact of the Incarnation. So much is plain on starting; but more is plain too. Miracles are not only not unlikely, but they are positively likely; and for this simple reason, because for the most part, when God begins, He goes on. We conceive, that when He first did a miracle, He began a series; what He commenced, He continued: what has been, will be. Surely this is good and clear reasoning. To my own mind, certainly, it is incomparably more difficult to believe that the Divine Being should do one miracle and no more, than that He should do a thousand; that He should do one great miracle only, than that He should do a multitude of lesser besides.... If the Divine Being does a thing once, He is, judging by human reason, likely to do it again. This surely is common sense. If a beggar gets food at a gentleman's house once, does he not send others thither after him? If you are attacked by thieves once, do you forthwith leave your windows open at night? ... Nay, suppose you yourselves were once to see a miracle, would you not feel the occurrence to be like passing a line? would you, in consequence of it, declare, ‘I never will believe another if I hear of one?’ would it not, on the contrary, predispose you to listen to a new report? ...

When I hear the report of a miracle, my first feeling would be of the same kind as if it were a report of any natural exploit or event. Supposing, for instance, I heard a report of the death of some public man; it would not startle me, even if I did not at once credit it, for all men must die. Did I read of any great feat of valour, I should believe it, if imputed to Alexander or Cœur de Lion. Did I hear of any act of baseness, I should disbelieve it, if imputed to a friend whom I knew and loved. And so in like manner were a miracle reported to me as wrought by a Member of Parliament, or a Bishop of the Establishment, or a Wesleyan preacher, I should repudiate the notion: were it referred to a saint, or the relic of a saint, or the intercession of a saint, I should not be startled at it, though I might not at once believe it. And I certainly should be right in this conduct, supposing my First Principle be true. Miracles to the Catholic are historical facts, and nothing short of this; and they are to be regarded and dealt with as other facts; and as natural facts, under circumstances, do not startle Protestants, so supernatural, under circumstances, do not startle the Catholic. They may or may not have taken place in particular cases; he may be unable to determine which, he may have no distinct evidence; he may suspend his judgment, but he will say ‘It is very possible;’ he never will say ‘I cannot believe it.’

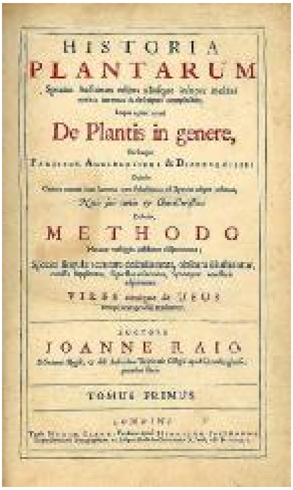
Take the history of Alfred; you know his wise, mild, beneficent, yet daring character, and his romantic vicissitudes of fortune. This great king has a number of stories, or, as you may call them, legends told of him. Do you believe them all? no. Do you, on the other hand, think them incredible? no. Do you call a man a dupe or a block-head for believing them? no. Do you call an author a knave or a cheat who records them? no. You go into neither extreme, whether of implicit faith or of violent reprobation. You are not so extravagant; you see that they suit his character, they may have happened: yet this is so romantic, that has so little evidence, a third is so confused in dates or in geography, that you are in matter of fact indisposed towards them. Others are probably true, others certainly. Nor do you force every one to take your view of particular stories; you and your neighbour think differently about this or that in detail, and agree to differ. There is in the museum at Oxford, a jewel or trinket said to be Alfred’s; it is shown to all comers; I never heard the keeper of the museum accused of hypocrisy or fraud for showing, with Alfred's name appended, what he might or might not himself believe to have belonged to that great king; nor did I ever see any party of strangers who were looking at it with awe, regarded by any self-complacent bystander with scornful compassion. Yet the curiosity is not to a certainty Alfred's. The world pays civil honour to it on the probability; we pay religious honour to relics, if so be, on the probability. Is the Tower of London shut against sight-seers, because the coats of mail and pikes there may have half-legendary tales connected with them? why then may not the country people come up in joyous companies, singing and piping, to see the Holy Coat at Trèves? There is our Queen again, who is so truly and justly popular; she roves about in the midst of tradition and romance; she scatters myths and legends from her as she goes along; she is a being of poetry, and you might fairly be sceptical whether she had any personal existence. She is always at some beautiful, noble, bounteous work or other, if you trust the papers. She is doing alms-deeds in the Highlands; she meets beggars in her rides at Windsor; she writes verses in albums, or draws sketches, or is mistaken for the house-keeper by some blind old woman, or she runs up a hill as if she were a child. Who finds fault with these things? he would be a cynic, he would be white-livered, and would have gall for blood, who was not struck with this graceful, touching evidence of the love her subjects bear her. Who could have the head, even if he had the heart, who could be so cross and peevish, who could be so solemn and perverse, as to say that some of these stories *may* be simple lies, and all of them might have stronger evidence than they carry with them? Do you think she is displeased at them? Why then should He, the Great Father, who once walked the earth, look sternly on the unavoidable mistakes of His own subjects and children in their devotion to Him and His? Even granting they mistake some cases in particular, from the infirmity of human nature and the contingencies of evidence, and fancy there is or has been a miracle here and there when there is not, though a tradition, attached to a picture, or to a shrine, or a well, be very doubtful, though one relic be sometimes mistaken for another, and St. Theodore stands for St. Eugenius or St. Agathocles, still, once take into account our First Principle, that He is likely to continue miracles among us, which is as good as the Protestant's, and I do not see why He should feel much displeasure with us on account of this, or should cease to work wonders in our behalf. In the Protestant's view, indeed, who assumes that miracles never are, our thaumatology is one great falsehood; but that is *his* First Principle, as I have said so often, which he does not prove but assume. If *he*, indeed, upheld *our* system, or *we* held *his* principle, in either case he or we should be impostors; but though we should be partners to a fraud if we thought like Protestants, we surely are not if we think like Catholics.

Such then is the answer I make to those who would urge against us the multitude of miracles recorded in our Saints' Lives and devotional works, for many of which there is little evidence, and for some next to none. We think them true in the same sense in which Protestants think the history of England true. When they say *that*, they do not mean to say that there are no mistakes, but no mistakes of consequence, none which alter the general course of history. Nor do they mean they are equally sure of every part; for evidence is fuller and better for some things than for others. They do not stake their credit on the truth of Froissart or Sully, they do not pledge themselves for the accuracy of Doddington or Walpole, they do not embrace as an Evangelist Hume, Sharon Turner, or Macaulay. And yet they do not think it necessary, on the other hand, to commence a religious war against all our historical catechisms, and abstracts, and dictionaries, and tales, and biographies, through the country; they have no call on them to amend and expurgate books of archæology, antiquities, heraldry, architecture, geography, and statistics, to re-write our inscriptions, and to establish a censorship on all new publications for the time to come. And so as regards the miracles of the Catholic Church; if, indeed, miracles never can occur, then, indeed, impute the narratives to fraud; but till you prove they are not likely, we shall consider the histories which have come down to us true on the whole, though in particular cases they may be exaggerated or unfounded. Where, indeed, they can certainly be proved to be false, there we shall be bound to do our best to get rid of them; but till that is clear, we shall be liberal enough to allow others to use their private judgment in their favour, as we use ours in their disparagement. For myself, lest I appear in any way to be shrinking from a determinate judgment on the claims of some of those miracles and relics, which Protestants are so startled at, and to be hiding particular questions in what is vague and general, I will avow distinctly, that, *putting out of the question* the *hypothesis of unknown laws of nature* (which is an evasion from the force of any proof), I think it impossible to *withstand the evidence* which is brought for the liquefaction of the blood of St. Januarius at Naples, and for the motion of the eyes of the pictures of the Madonna in the Roman States. I *see no reason to doubt* the material of the Lombard crown at Monza; and I *do not see why* the Holy Coat at Trèves may not have been what it professes to be. I *firmly believe* that portions of the True Cross are at Rome and elsewhere, that the Crib of Bethlehem is at Rome, and the bodies of St. Peter and St. Paul also.... Many men when they hear an educated man so speak, will at once impute the avowal to insanity, or to an idiosyncrasy, or to imbecility of mind, or to decrepitude of powers, or to fanaticism, or to hypocrisy. They have a right to say so, if they will; and we have a right to ask them why they do not say it of those who bow down before the Mystery of mysteries, the Divine Incarnation?

Some Lights from John Ray (1627-1705)

Anthony Nevard

Son of a blacksmith, Ray was born in the village of Black Notley, Essex. Following grammar school in Braintree, he went to Cambridge, eventually graduating and being elected Fellow of Trinity, where he initially taught Greek, mathematics and humanities, but later he began to study natural history. He took holy orders in 1660, but following the restoration of Charles II, in 1662 Ray refused the Act of Uniformity and had to leave Trinity. By then, he had published his first attempt at classification, listing 558 species of plants around Cambridge.



HISTORIA
PLANTARUM

De Plantis in genere,

METHODO

JOANNE RAIO

TOMUS PRIMUS

With the help of his friend Francis Willughby, he published *Catalogus Plantarum Angliae* (1670), and developed a taxonomic system in *Methodus Plantarum Nova* (1682) based on plant physiology, morphology and anatomy. He categorised them into flowerless plants, monocotyledons and dicotyledons, and defined 36 families. For him, the species was the fundamental unit of taxonomy. This system was to form the basis for Linnaeus's work in the 18th century. The culmination of Ray's work was *Historia Generalis Plantarum*, published in three volumes between 1686 and 1704, describing about 18,600 plant species. This work included details on plant habitats, distribution, pharmacological uses, diseases and germination. [1]

Ray also worked on the classification of animals: quadrupeds, birds, fish and 'insects' (then a much broader term for most invertebrates). He wrote on theological subjects related to Creation, the Flood, fossils and the future dissolution of the world in his book *The Wisdom of God manifested in the Works of the Creation.*

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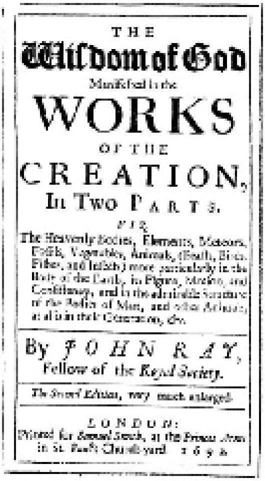
[1] Pictures on this page in public domain: https://commons.wikimedia.org/wiki/Category:John_Ray



THE
Wiſdom of God
Manifested in the
WORKS
OF THE
CREATION,
In Two Parts.

By JOHN RAY,
Fellow of the Royal Society.

The Second Edition, very much enlarged.

LONDON:

In his in-depth biography of Ray, Charles Raven writes that Ray's 'new philosophy':

> "did not in itself or inevitably raise issues in which the new came into conflict with the old nor force its exponents to recognise that they were creating a fresh interpretation of the universe. Ray, like Linnaeus or Gilbert White,[2] could go on with his natural history without consciously challenging the historicity of Genesis, or the traditional dating and method of the creation. It was only in his incursions into geology and the study of 'formed stones' that he entered the arena of conflict."[3]

Towards the end of his career as a botanist, Ray extended his studies to trees and ferns embedded in rocks. He was convinced that these fossils had once been alive. He outlined his reasoning in his *Miscellaneous Discourses* (1692). This followed the work of Nicolaus Steno,[4] whom he had met at Montpellier. Ray had also read Hooke's *Micrographia* and Kircher's *Mundus subterraneus*.[5] From the 1660s he had been making notes on the nature and distribution of fossils across England and Europe. He observed that fossil shells appear in many places across England, and described the buried forest at Bruges and a bed of cockleshells 100 feet deep that had been found when a well was dug in Amsterdam. This led him to suggest:

> [in the first case] "that many years ago before all records of antiquity these places were part of the firm land and covered with wood; afterwards being over-whelmed by the violence of the sea they continued so long under water till the rivers brought down earth and mud enough to cover the trees, fill up these shallows and restore them to firm land again"; [and in the second] "that of old time the bottom of the sea lay so deep and that that hundred foot thickness of earth arose from the sediments of

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[2] English clergyman/naturalist (1720-1793), popular author of *The Natural History and Antiquities of Selbourne* (1789), a village in Hampshire, England. *Ed.*

[3] Raven, C.E., *John Ray, Naturalist, His Life and Works*, Cambridge University Press (1942), pp. 419-420.

[4] A two-part biography of Steno (Bishop Stensen) by James Walsh was reprinted in *Daylight* 55 (Sep. 2016) and *Daylight* 56 (Feb. 2017).

[5] A two-part biography of Fr Kircher by James Walsh was reprinted in *Daylight* 53 (Dec. 2015) and *Daylight* 54 (Apr. 2016).

> those great rivers which there emptied themselves into the sea ... which yet is a strange thing considering the novity of the world, the age whereof, according to the usual account, is not yet 5600 years" [6]

Ray must at this time have been conflicted in his mind by the fact that these fossils occurred very widely and abundantly, and that some of them were bigger in size and form than any known living type could have produced. Their occurrence also implied that great physical changes in sea and land levels must have happened in the past. At the same time, he knew there were then some 'philosophers' who did not believe that fossils were once alive, but had been formed in the rocks by some unknown power.[7] As a Bible-believing Christian, he also believed the Creation took place about 4000 BC, which was commonly accepted by Christian scholars before Archbishop Ussher fixed a date of 4004 BC in his *Annals* (1650).

> The most interesting of his early notes is that which deals with the fossils of Malta. The island he considers 'to have been in the most ancient times nothing else but a great rock wholly overwhelmed and covered with the sea; especially if we consider the multitude of sea shells of all sorts, sharks' teeth, vertebras of thornbacks and other fish bones petrified, found all over the island' […] Ray writes 'that these were formed by some plastic power in the stone-quarries, being nothing else but the effects or productions of Nature sporting herself in imitation of the parts and shells of these animals I can hardly be induced to believe; Nature (which is indeed nothing else but the ordinary power of God) not being so wanton and toyish as to form such elegant figures without further end or design than her own pastime and diversion' [8]

Two influential English naturalist/philosophers in those days were John Woodward, whose work *An Essay toward a Natural History of the Earth* was first published in 1695, and Robert Hooke, author of *Micrographia*, who also affirmed that fossils provided evidence of real life forms from the distant past. Hooke also speculated on both the possibility of extinction and that of new kinds arising; in a volume entitled *Robert Hooke – Tercentennial Studies,* Cooper and Hunter, Ed., (2006), in an article *Hooke's Ideas of a Terraqueous*

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[6] Raven, *op.cit.*, p.421

[7] Charles Lyell, in his *Principles of Geology*, quotes Dr Plot, in his *Natural History of Oxfordshire* (1667), as attributing fossil shells and fish to 'a plastic virtue latent in the earth.' Martin Lister (1639-1712), the 'father of conchology' and a spider expert, recognised the possibility that some species might have become extinct. It was he who realised the continuity of strata across the country and first proposed the construction of geological maps. He donated a significant natural history collection to the Ashmolean Museum in Oxford; he is also credited with inventing the histogram chart.

[8] Raven, *op.cit.*, p.422

Globe and a Theory of Evolution, Ellen Tan Drake opines that Hooke actually foreshadowed Darwin's ideas and laid the foundations of modern geology. [9]

There were issues of concern related to Scripture and theology. If new life forms had been created since the Genesis days, did this not contradict the text which states that God had completed His work on the sixth day? If others had been allowed to die out, did this not imply deficiencies in God's Power, Wisdom and Providence? [10] John Ray, quoting Raven, "sets out two very considerable objections:"

> "The first is that if these are organic remains then 'all the earth was once covered by the sea', for they are found in the middle of Germany and upon the highest mountains of Europe. This is hard to believe and hard to reconcile with Scripture. He refuses to accept the belief that they were brought in by the deluge in the time of Noah; for this was due to rain and would have carried shells down to the sea not up from it; or if it was due, as some argued, 'to an overflowing of the sea this would have scattered such shells instead of laying them in great beds in particular places─ 'such beds seem to have been the effect of those animals breeding there for some considerable time'. The argument that the mountains were raised subsequently by earthquakes he does not entirely dismiss; for he admits that this has happened: but he argues that in fact 'since the most ancient times recorded in history, the face of the earth hath suffered little change', and therefore 'if the mountains were not from the beginning, either the world is a great deal older than is imagined, there being an incredible space of time required to work such changes ... or in the primitive times the creation of the earth suffered far more concussions and mutations in its superficial part than afterwards'. Secondly, many if not all of these petrified shells are not to be found alive anywhere. 'If it be said that these species be lost out of the world, that is a supposition which philosophers hitherto have been unwilling to admit.' If some few have disappeared, it is difficult to believe that whole genera consisting of many species should be utterly extinct: 'such are for example the Serpentine stones or Cornua Ammonis supposed originally to have been Nautili, of which I myself have seen five or six distinct species, and doubtless there are yet many more. Add hereunto the greatness of some of these shells whereof there are found of about a foot diameter, far exceeding the bulk of any shell-fish now living in our seas.' [11]

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[9] Search on: https://books.google.co.uk/books for resources on these works.

[10] These ideological conflicts in England were, of course, taking place in a Protestant context of Biblical literalism and a mind-set that had become inclined to assume that the fossils were not formed by the Deluge and pre-dated mankind. This automatically gave rise to the problem of death not coming into the world until the curse following Adam's sin. This period also preceded the discovery of dinosaurs.
Back in the early 16th century, Leonardo da Vinci (d. 1519) in Italy was already convinced that fossils were genuine remains of marine animals and needed no mythical origins theory.

[11] Raven, *op.cit.*, p.425

Has Ray's view of fossils been misunderstood?

In researching this subject, I discovered that certain American writers seem to have concluded that Ray did not accept an organic origin for fossils. For example, the following appears in Whitcomb and Morris's *The Genesis Flood*:

> Before 1800, some of the outstanding theologians of the Church were of the opinion that the Genesis Flood not only was universal in extent but also was responsible for the reshaping of the earth's surface, including the formation of sedimentary strata. Among those who held this view were Tertullian, Chrysostom, Augustine, and Luther.
>
> It is somewhat surprising to learn, however, that the Flood theory of geology had to overcome serious opposition in the seventeenth century before it became generally accepted by scientists and theologians in the western world. John Ray (1692), John Arbuthnot (1697), and Edward Lhwyd (1692), among others, insisted that fossils were not the remains of plants and animals from an earlier age but were freaks of nature, "produced by a certain 'fatty matter,' set into fermentation by heat, giving birth to fossil shapes," or the seeds and germs of living things which "sank down into the rocks through pores, and there grew into fossil forms," or even that the fossils had been created by God just to puzzle men and to test their faith! [12]

Firstly it is gratifying to note that these canonised Saints and Doctors of the Church are included on the side of the Angels! (I have resisted the temptation to sidetrack further here on these statements but hope to return to this subject in a future article.) Secondly, there seems to be some confusion between the arguments as to whether fossils truly represent previously living creatures, and whether fossils were all produced as a consequence of Noah's Flood. In addition, a hasty reading of some of Ray's passages might lead one to an opposite conclusion, as he often cited arguments that he disagrees with and then provided a counter-argument. Just as one might selectively quote an objection from St Thomas Aquinas or an anathematised doctrine of the Church and then mistakenly claim they teach rank heresy!

From my reading of Henry Morris's works, his research seemed comprehensive, his writings honest, fair and balanced, and his books thoroughly documented. In this case, however, he seems to have depended on Byron Nelson's book, for which he wrote an introduction in 1968, for his information on John Ray. Nelson wrote:

> Of those in England who opposed the Flood theory because they did not believe that fossils were the remains of former living things, the most prominent was John Ray,

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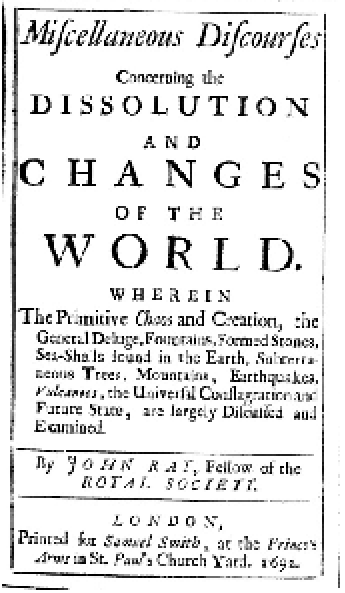
[12] Whitcomb, J., Morris, H., *The Genesis Flood*, Baker Book house (1961), pp. 90-91. Quoting from Nelson, Byron C., T*he Deluge Story in Stone*, pp. 7-10, p. 31

> author in 1692 of "Three Physic-Theological Discourses." Ray believed the Bible. He also believed that the flood changed the world considerably. But his erroneous opinion about fossils led him to disbelieve in the Flood as the producer of the stratified rocks. [13]

We have agreed that he discussed some difficulties raised where certain interpretations of the fossil evidence appeared in conflict with a literal reading of Genesis. He did not claim to have answered all of these problems, and I think no-one has yet fully done so even today. However, in my view, Nelson and Morris have drawn the wrong conclusion. Firstly I shall quote Ray's own words (edited for brevity) from his *Miscellaneous Discourses* (1692), the section 'Consequences of the Deluge:'



Miſcellaneous Diſcourſes
Concerning the
DISSOLUTION
AND
CHANGES
OF THE
WORLD.
WHEREIN
The Primitive *Chaos* and Creation, the General Deluge, Fountains, Formed Stones, Sea-Shells found in the Earth, *Subterraneous* Trees, Mountains, Earthquakes, *Vulcanoes*, the Univerſal Conflagration and Future State, are largely Diſcuſſed and Examined.

By JOHN RAY, Fellow of the ROYAL SOCIETY.

LONDON,
Printed for *Samuel Smith*, at the *Prince's Arms* in St. *Paul's* Church Yard. 1692.

> My fore-mentioned Friend Mr *Lloyd* sent me perfect *Escallop* and Sea-Urchin Shells, exactly resembling the like Sea Shells, both for figure, colour, weight and consistency: which he himself gathered up near *Oxford*. Now that Nature should form real Shells, without any design of covering an Animal, is indeed so contrary to that innate *Prolepsis* [14] we have of the Prudence of Nature, (that is the Author of Nature) that without doing some Violence to our Faculties, we can hardly prevail with our selves to believe it: and gives great countenance to the Atheists assertion, that things were made or did exist by chance, without counsel of direction to any end.
>
> And hereto Thirdly, That there are other Bodies besides Shells found in the Earth, resembling the Teeth and Bones of some Fishes, which are so manifestly the very things they are thought only to resemble, that it might be esteemed obstinacy in any man that have viewed and considered them to deny it. […]
>
> Fourthly, if these formed Stones be indeed original Productions of Nature, in imitation of Shells and Bones, how comes it to pass, that there should be none found, that resemble any other natural Body, but the Shells and Bones of Fishes only? Why should not Nature as well imitate the Horns, Hoofs, Teeth, or bones of Land Animals, or the Fruits, Nuts and Seed of Plants? […]
>
> Fifthly, Those that deny these Bodies to have been the Shells and Bones of Fishes have given us no satisfactory account of the manner of their Production. […]

---

[13] Nelson, *op. cit.* , p. 37.

[14] Prolepsis = a preface intended to anticipate and answer an objection to an argument, *Ed.*

> So I have finished what I have to alledge [*sic*] in defence of the latter part, That these formed Stones, were sometimes the real Shells or Bones of Fishes, I mean the figured part of them. [15]

Raven comments unambiguously on this section of Ray's book:

> "From the whole of his treatment of the problem it is clear that though anxious to set out the different arguments fairly his own inclination is towards the organic origin of all formed stones that resemble shells, bones or other parts of living creatures..." [16]

And a final confirmation on this, a quotation from Asimov's encyclopaedia:

> "His views on fossils were rather enlightened for the time. In 1691 [sic] he published an account in which he declared fossils were the petrified remains of extinct creatures. This was not accepted by biologists generally until a century later." [17]

Conclusion

We have established that John Ray was a Bible-believing non-conformist Christian who accepted the true nature of fossil evidence and tried to reconcile this with his understanding of the Scriptures. He contributed sound argumentation to rejecting the notion of spontaneous generation, and speculated on the nature of the Deluge and the future dissolution of the world. But he is rightly best honoured for his scientific work:

> "Ray's literary work was extensive and many-sided ─ sermons and religious essays, handbooks on the classics, treatises on folk-lore, and, finally, the works on natural science on which his fame entirely rests. […] For his age, [his system] constitutes an extraordinary advance, primarily in that he clearly realised the difference between species and genus, secondly on account of his possessing what was undeniably ─ in comparison with his predecessors ─ an extremely keen eye for the similarities on which the assumption of affinity in its wider sense may be based; several of his larger groups, both in the vegetable and in the animal kingdom, are "natural" in the best sense of the word. In the sphere of botany, also, the difference discovered by him between mono-and dicotyledons is of essential importance." [18]

In the words on a commemorative slab outside Braintree Museum, unveiled by David Bellamy in 1986: "John Ray - Botanist, Zoologist, Theologian and Traveller, the Most Distinguished British Naturalist of the 17th Century."

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[15] Ray, J. *Miscellaneous Discourses Concerning the Dissolution and Changes of the World.* Printed for Samuel Smith, London, 1692, pp. 109-116 (punctuation & italics in original) [Facsimile copy is dedicated to 'John, Lord Archbishop of Canterbury' (Dr John Tillotson)]

[16] Raven, *op. cit*., p.433

[17] Asimov, I., *Asimov's Biographical Encyclopaedia of Science and Technology,* Pan Books Ltd (1975), p.125.

[18] Nordenskiöld, E, *The History of Biology,* Tudor Pub., N.Y. (1928), pp. 199, 202.

Spencer Skewers Natural Selection of Horns

From: *The Principles of Biology*, Vol. I [1]

Herbert Spencer

** Despite him being an evolutionist, Spencer's argument here, taken from his massive two-volume text, written in 1898, weakens the credibility of Darwinism.*

Mr. Darwin himself argues "that natural selection is continually trying to economise in every part of the organization. If under changed conditions of life a structure before useful becomes less useful, any diminution, however slight, in its development, will be seized on by natural selection, for it will profit the individual not to have its nutriment wasted in building up an useless structure." In other words, if any muscle has more fibres than are required, or if a bone is stronger than needful, no advantage results, but rather a disadvantage—a disadvantage which will decrease the chances of survival. Hence it follows that among any organs which habitually act in concert, an increase of one can be of no service unless there is a concomitant increase of the rest. The cooperative parts must vary together; otherwise variation will be detrimental. A stronger muscle must have a stronger bone to resist its contractions; must have stronger correlated muscles and ligaments to secure the neighbouring articulations; must have larger blood-vessels to bring it supplies; must have a more massive nerve to transmit stimulus, and some extra development of a nervous centre to supply the extra stimulus. The question arises, then,—do variations of the appropriate kinds occur simultaneously in all these cooperative parts? Have we any reason to think that the parts spontaneously increase or decrease together? The assumption that they do seems to me untenable; and its untenability will, I think, become conspicuous if we take a case, and observe how extremely numerous and involved are the variations which must be supposed to occur together. In illustration of another point, we have already considered the modifications required to accompany increased weight of the head. [2] Instead of the bison, the moose deer, or the extinct Irish elk, will here best serve our purpose. In this last species the male has enormously-developed horns, used for purposes of offence and defence. These horns, weighing upwards of a hundred-weight, are carried at great mechanical disadvantage: supported as they are, along with the massive skull which bears them, at the extremity of the outstretched neck. Further, that these heavy horns may be of use in fighting, the supporting bones and muscles must be strong enough, not simply to carry them, but to put them in motion with the rapidity needed for giving blows. Let us, then, ask how, by natural selection, this complex apparatus of bones and muscles can have been developed, *pari passu* with the horns? If we suppose the horns to have been originally of like size with those borne by other kinds of deer; and if we suppose that in some individual they became larger by spontaneous variation; what would be the concomitant changes required to render their greater size useful? Other things equal, the blow given by a larger horn would be a blow given by a heavier mass moving at a smaller velocity; the momentum would be the same as before, and the area of contact with the body struck being somewhat increased, while the velocity was decreased, the injury done would be less. That horns may become better weapons, the whole apparatus concerned in moving them must be so strengthened as to impress more force on them, and to bear the more violent reactions of the blows given. The bones of the skull on which the horns are seated must be thickened; otherwise they will break. The vertebrae of the neck must be further developed; and unless the ligaments which hold together these vertebrae, and the muscles which move them, are also enlarged, nothing will be gained. Again the upper dorsal vertebrae and their spines must be strengthened, that they may withstand the stronger contractions of the neck-muscles; and like changes must be made on the scapular arch. Still more must there be required a simultaneous development of the bones and muscles of the fore-legs; since these extra growths in the horns, in the skull, in the neck, in the shoulders, add to the burden they have to bear; and without they are strengthened the creature will not only suffer from loss of speed but will fail in fight. Hence, to make larger horns of use, additional sizes must be acquired by numerous bones, muscles, and ligaments, as well as by the blood-vessels and nerves on which their actions depend. On calling to mind how the spraining of a single small muscle in the foot incapacitates for walking, or how permanent weakness in a knee-ligament will diminish the power of the leg, it will be seen that unless all these many changes are simultaneously made, they may as well be none of them made—or rather, they would better be none of them made; since the enlargements of some parts, by putting greater strains on connected parts, would render them relatively weaker if they remained unenlarged. Can we with any propriety assume that these many enlargements duly proportioned will be simultaneously effected by spontaneous variations? I think not. It would be a strong supposition that the vertebrae and muscles of the neck suddenly became bigger at the same time as the horns. It would be a still stronger supposition that the upper dorsal vertebras not only at the same time became more massive, but appropriately altered their proportions, by the development of their immense neural spines. And it would be an assumption still more straining our powers of belief, that along with heavier horns there should spontaneously take place the required strengthenings in the bones, muscles, arteries, and nerves of the scapula and the fore-legs.

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[1] Spencer, H., *The Principles of Biology*, Vol. I, Williams and Norgate (1898), pp. 536-539. Punctuation retained as in original. (This extract was part of a longer paragraph!)

[2] On p. 512, Spencer argues in a similar way that modifications such as the growth of massive horns must be accompanied by numerous 'secondary and tertiary' other anatomical and physiological changes essential to sustain an advantage and therefore survival.

Insights from Creation Research on Climate Change

From the Kolbe Report, 30 November 2019

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It was during the planning of this issue of Daylight that I thought of writing a short article on this subject. A few days later, providentially, I read the following which includes useful source material not then available to me. I am still reading further on this 'hot topic' but a few points are already clear to me:
(a) the science in this area is highly complex and much of what is claimed to be factual is often biased and speculative;
(b) the subject has become politicised and 'weaponised,' employing simplistic slogans, personal abuse and attempts to shut down discussion;
(c) rational debate is confused by polarising the issue into two camps, instead of judging its many components on their own terms;
(d) there seems to be a dishonest and unfair attempt to conflate reducing the use of fossil fuels with reducing pollution and plastics, enacting conservation measures, and 'saving the planet,' as if opposing one is to oppose all the rest.

One fact is certain: there is no consensus of experts on the causes, extent, effects or prognosis of 'climate change,' unless you just exclude everyone who disagrees with your own viewpoint. The science is **not** settled. *Ed.*

Dear Friends of the Kolbe Center,

Pax Christi!

On a recent, brief visit to Texas, I was able to meet for over an hour with Dr. Jack Hebert and Dr. Timothy Clarey, two scientists who work at the Institute for Creation Research in Dallas, Texas. Dr. Hebert has just written a book on the climate change controversy, and I would like to give you a brief synopsis of his insights into the subject, as a physicist who earned his Ph.D. in physics for research into, in his words, "the possible connection between cosmic rays, solar rays, weather and climate."

In the first part of his book, Dr. Hebert explains the unresolved question that lies at the heart of the controversy between scientists who believe that human activity is leading to runaway global warming and ecological catastrophe and those who believe that the Earth has a stable climate and is not in danger of catastrophic global warming as a result of increased carbon emissions. One of the best proofs that the Earth has experienced substantial global warming in fairly recent times that did not result from human activity is the historical evidence that temperatures were significantly higher during the Middle Ages over a large part of the Earth's surface in what scientists call "the Medieval Warm Period." Between 950 and 1250 A.D., in Dr. Hebert's words, "the world was warmer than it is today."

Climate alarmists tend to ignore or minimize the significance of this fact while arguing that a sharp increase in atmospheric carbon dioxide would lead to a runaway increase in temperatures with catastrophic consequences for the environment. Dr. Hebert shows that some of the world's leading experts in climatology, like Dr. Judith Curry - who has published 200 scientific papers in the field - argue from basic physics that a doubling of the carbon dioxide in the atmosphere would only produce a modest increase in temperature. Moreover, as Dr. Hebert explains, a modest increase in temperature and carbon-dioxide would be *good* for the environment. It would make more of the Earth habitable and would foster plant growth. The burgeoning plant-life would then take in more CO2, reducing the amount of CO2 in the atmosphere. [1]

Earth: Product of Random Evolution or Special Creation?

Dr. Hebert uses this point to highlight that the most important difference between climate change alarmists and those who take a more balanced view of the subject is that the former tend to look at CO2 and temperature in isolation from the whole environment while those who take a more balanced view look at these elements in relation to the whole. Dr. Hebert quotes physicist Freeman Dyson on this important point:

> We know that plants do react very strongly to enhanced carbon dioxide. At [the Institute for Energy Analysis], they did lots of experiments with enhanced carbon dioxide and it has a drastic effect on plants because it is the main food source for

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[1] As has also been claimed by the late Professor of Botany Dr David Bellamy and the popular maths 'TV star' Johnny Ball. The website www.friendsofscience.org is very informative. I am reading more books on this controversial subject and hope to report further in the next issue. *Ed.*

> the plants . . . So if you change the carbon dioxide drastically by a factor of two, the whole behavior of the plant is different. Anyway, that's so typical of things [climate change alarmists] ignore. They are totally missing the biological side, which is probably more than half of the real system.[2]

Dr. Hebert shows how this tendency of climate alarmists not to look at climate change in relation to the Earth's entire ecosystem reflects their belief that the Earth and its climate were the product of millions of years of random evolution rather than of special creation and intelligent design.

> Consider this scenario. As atmospheric carbon dioxide increases, temperatures warm. As temperatures warm, glacial ice melts. As this melt-water enters the ocean, so do iron-containing minerals. It is well known that iron in seawater increases the amount of algae. The iron stimulates "blooms" of algae, which use and trap the carbon dioxide, incorporating the carbon with their cells. When the algae die, they drift to the bottom of the ocean. This removes carbon dioxide from the atmosphere and sequesters it on the ocean floor. In describing this mechanism one secular scientist said, "The Earth itself seems to want to save us [from global warming]!" Of course, it is God who should be given the credit for the design of our climate system, not the Earth! [3]

The Global Flood: A Key to Unlocking the Mystery of Earth's History

Dr. Hebert goes on to show that one of the main reasons - if not the main reason - why so many secular scientists believe that modest changes in CO2 levels can lead to catastrophic climate change is their belief in the standard evolutionary chronology of the Earth and their denial of the Global Flood. By correlating changes in the relative positions of the Earth and the sun over millions of years with ice cores, many climate scientists have convinced themselves that Earth's climate has a history of instability. In reality, the ice cores can only be rightly interpreted in light of the Global Flood and the subsequent Ice Age about 4500 years ago.

Noah, The Eve of the Deluge,

Cleveland Museum of Art

Dr. Hebert argues convincingly that slow and gradual changes in climate would never produce an Ice Age, because cold air holds less moisture than warm air, and an Ice Age requires an abundance of moisture in the atmosphere with relatively cool summers and mild winters. Only the Global Flood would have produced the unique conditions necessary to precipitate an Ice Age. First, the fountains of the great deep were broken up and spewed enormous amounts of warm water into the atmosphere. Then volcanic activity all over the Earth propelled debris into the air, partially blocking sunlight, lowering temperatures, and leading to intense precipitation. Finally, in the immediate post-Flood period, lingering volcanic activity spewed aerosols into the atmosphere, resulting in cool summers which prevented ice and snow from melting, leading to the formation of extensive glaciers. The advance and retreat of the glaciers continued for several centuries, but always as part of one Ice Age, not in separate Ice Ages lasting for millions of years. Trying to interpret ice cores within a uniformitarian evolutionary framework which denies the historical reality of the Flood feeds the alarmism of scientists who conclude that small and gradual changes in the past led to multiple Ice Ages and that therefore small changes in CO2 levels and temperatures can lead to catastrophic climate change in the near future.

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[2] Jake Herbert, *The Climate Change Conflict* (Dallas: ICR, 2019), pp. 10-11.

[3] *Ibid.*

Through the prayers of the Mother of God, may the Holy Spirit confirm our faith in the sacred history of Genesis, and lead us all into all the Truth!

Yours in Christ through the Immaculata, Hugh Owen

Of Your Charity

Please pray for the souls of past and recently deceased supporters of 'Daylight', including:

Fr Peter Fehlner, OFM (Conv.) [author of *In the Beginning*]
Fr Peter Lessiter (8 Sep 2018)
[author of *Man's Origins* and *Man and the Evolution Myth*]

Fr Hugh Thwaites
Mr John Barbour
Dr Siegfried Edwards
Mr Clement Butel
Miss Monica Flynn
Miss Paula Haigh
Mr Owen Holmes
Sr Kostka
Fr H. Leahy OSA
John Olner
Miss Margaret Lott
Br Thomas Mary Sennott
Mrs Zita Dew

Mrs Prima Dunn (d. 10 Dec 2019 age 98; mother-in-law of Editor)

Requiescant in pace

Extracts from the Press

'God Threshold' of one million

"Societies hit a "God threshold" at around one million people when they need a moralising, rule-making deity to keep order […] a study by Oxford University and Keio University in Japan found that only "megasocieties" … required the kind of unyielding cohesive beliefs that gave rise to major religions such as Christianity, Judaism, Islam and Buddhism. The authors examined 414 societies spanning the past 10,000 years … contrary to previous predictions, powerful "big gods" issuing supernatural punishments followed the emergence of large-scale cooperation, proving religion played a crucial role in human evolution … The first appearance of moralising gods was in Egypt … around 2800 BC … similar systems emerged in Anataloia by 1500 BC and China by 1000 BC."

Daily Telegraph, 21 Mar 2019.

COMMENT: If human evolution has been progressing for hundreds of thousands of years, and religion 'played a crucial role,' how come the earliest claimed evidence is only about 5000 years ago? And what better explanation can there be for the origins of Judaism and Christianity than the texts of the Old and New Testaments?

Darwin's litter-strewn atolls

Australia's Cocos Islands, visited by Darwin, are littered with an estimated 238 tons of plastic. "The remote islands have a population of just 529, proving that most of the debris is being carried in by ocean currents from more populated areas of the world … Tasmanian researchers also discovered in 2017 that the remote Henderson Island in the South Pacific had the highest density of plastic debris anywhere on earth … 38 million pieces weighing 17 tons … Dr Annett Finger from Victoria University said: 'The only viable solution is to reduce plastic production and consumption while improving waste management to stop this material entering our oceans in the first place.' " *DT, 17 May 2019*

COMMENT: Absolutely correct, in my view. However, figures from tourism suggest about 3000 visitors annually, strongly promoted with the tag 'Welcome to Paradise.' Maybe these are the people adding to the problem, though contributing to local economy.

Methane "burps" not by Martians

"Analysis of data collected by the European Space Agency's Mars Express orbiter confirmed signals of methane recorded by Nasa's Curiosity rover in June 2013, but concluded its origin was unlikely to be biological. Methane is thought to be a marker of life on distant planets because on Earth it is generated by living organisms and destroyed quickly in the atmosphere, so detection suggests it must have been released recently … a new study found it probably emanated from a nearby area of tectonic activity, and so could have seeped from the ground." *DT, 2 Apr 2019*

COMMENT: Back in the day, they looked for meaningful radio signals from space; then they rejoiced at finding traces of amino-acids; then they enthused that they had found water; now it's just detecting methane (CH_4).
Proof of life? There is still no plausible scientific evidence for the spontaneous appearance of life on earth.

'Scottish Stonehenge' misdated

Archaeologists announced the discovery of a 4,500-year-old stone circle on an Aberdeenshire farm in December 2018. They "hoped it might change their understanding of prehistoric building … This week a farmer who had once owned the land got in touch to say he had built in himself in the Nineties. Neil Ackerman, the historic environment record assistant at Aberdeenshire council, said 'These types of monument are notoriously difficult to date.' " However, a rich cover of lichen was said by expert Adam Welfare to be 'indicative of the ring's antiquity.' "Lichen grows very slowly and certain types can be used as a marker of age." *DT, 22 Jan 2019*

COMMENT: Apparently, some locals were reluctant to believe that this attractive feature was nothing like as ancient as their imaginations had suggested! Such a mind-set seems also to afflict palaeontologists who can't de-program 'millions of years' from their heads when they look at old bones and fossils.

Tuskless elephants evolve in Africa

Of around 2,500 elephants living in Mozambique before the civil war (1977-1992), 90% were killed for ivory. "Scientists have noticed that nearly one third of the females born since the war have lost their tusks. Normally, fewer than four per cent of a population are born without tusks, but because tuskless animals were ignored by poachers, they gained a biological advantage and were able to mate, and pass on their genes … Researchers have also noticed that the females have developed a 'culture of aggression' and have a low tolerance to vehicles and people, which is likely to stem from a desire to protect their group against poachers, but could also be linked to the lack of tusks, which makes them vulnerable." *DT, 12 Jan 2019*

COMMENT: This is a classic example of selection pressure against development of an organ or feature, such as blind cave-fish or flightless birds, which fails to explain how tusks, eyes or wings might have evolved in the first place. The article includes reference to the old favourites, Darwin's finches and peppered moths. In the case of elephants, research has shown they have significant individual and social 'psychology' and 'culture' that can affect populations through traumas. Recommended reading: Elephants on the Edge*, by G.A. Bradshaw, Yale University Press.*

A new 'living fossil' frog

"A thumb-sized 'living fossil' frog that has remained hidden for millions of years has been discovered on a remote mountain range in India … its species is the sole survivor of an ancient frog lineage stretching back millions of years … experts have named the frog

Astrobatrachus kurichiyana … Dr David Blackburn, a member of the US team behind the discovery, said: 'This frog has no close sister species for maybe tens of millions of years.' "

DT, 13 Mar 2019

COMMENT: This short item managed to repeat the 'MoY' phrase four times in 120 words, a typical technique of continuous evolutionary media propaganda! This seems to be a new example of the admitted absence of evolution. A good resource on this subject is a DVD by Dr Carl Werner entitled: Living Fossils – Evolution: the Grand Experiment.

David Bellamy OBE, d. 11 Dec 2019

"He studied botany at Chelsea College of Science and Technology, and took a PhD at Bedford College … By the age of 27 he was a junior lecturer at Durham University … continued as senior lecturer in botany until 1982." Bellamy was president or trustee for many wildlife and conservation groups, hosted numerous TV shows in the 1970s and 80s, and wrote 40 books and numerous scientific papers. He led many conservation campaigns but strayed from 'political correctness' by standing for the Referendum Party in 1997, favouring hunting, and his "contentious public statements about man-made global warming – namely his belief that it is "poppycock" – that put Bellamy on a collision course with the green consensus. His television career effectively came to an end after a 1996 appearance on Blue Peter when he dismissed wind farms as little more than green totemism."*DT, 12 Dec 2019*

COMMENT: Surely millions of my generation remember David Bellamy with affection and respect, though of course he did help to promote evolutionism. He was the second person to appear on the front cover of Nature – after Darwin! He later lost the support of some environmental charities. Four of his five children were adopted, and I gather he retained his Christian faith, dying at 86. There are many obituaries of him in the media, and some YouTube interviews. RIP.

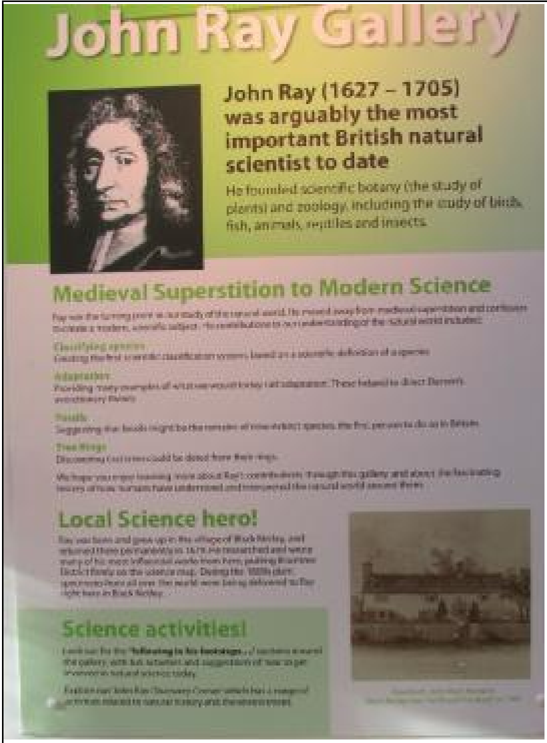
Climate change leads to fat horses

"A study of 792 horses by the British Equine Veterinary Association last year reported 31 per cent overweight … Gillies Moffat … said the wetter and warmer climate has meant the animal's staple food [grass] has grown more rapidly than in the past … This makes it more difficult for owners to recognise the importance of feed quantities and qualities for their horses.' " *DT, 30 Nov 2019*

Climate change could boost crops

"In a ground-breaking trial, researchers [at the John Innes Centre in Norfolk] heated small plots of land to mimic the temperatures that Britain may reach in the coming decades. The extra heat allowed the crop [of oil-seed rape] to flower later, giving weeks of extra growth which could raise yields by up to 30 per cent." *DT, 6 Dec 2019*

COMMENT: Two examples of economic benefits of increasing crop yields in Britain, thanks to warmer average temperatures. This is also favoured by raising CO_2 *levels – the essential plant food, as Bellamy argued!*



John Ray Gallery

John Ray (1627 – 1705) was arguably the most important British natural scientist to date

He founded scientific botany (the study of plants) and zoology, including the study of birds, fish, animals, reptiles and insects.

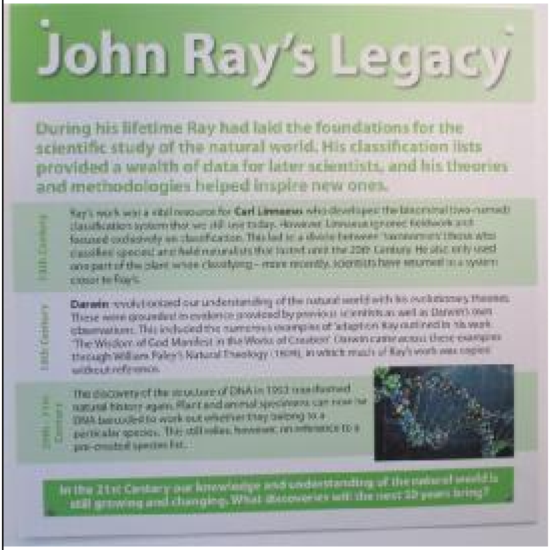
Medieval Superstition to Modern Science

Local Science hero!

Science activities!

Posters from the John Ray Gallery,
Braintree Museum, Essex

Black Notley church, Essex
Site of John Ray's burial

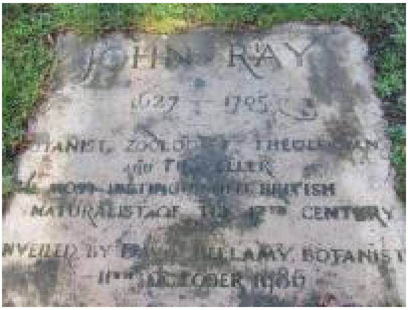


John Ray's Legacy

During his lifetime Ray had laid the foundations for the scientific study of the natural world. His classification lists provided a wealth of data for later scientists, and his theories and methodologies helped inspire new ones.

Statue of John Ray
(outside museum
in Braintree)

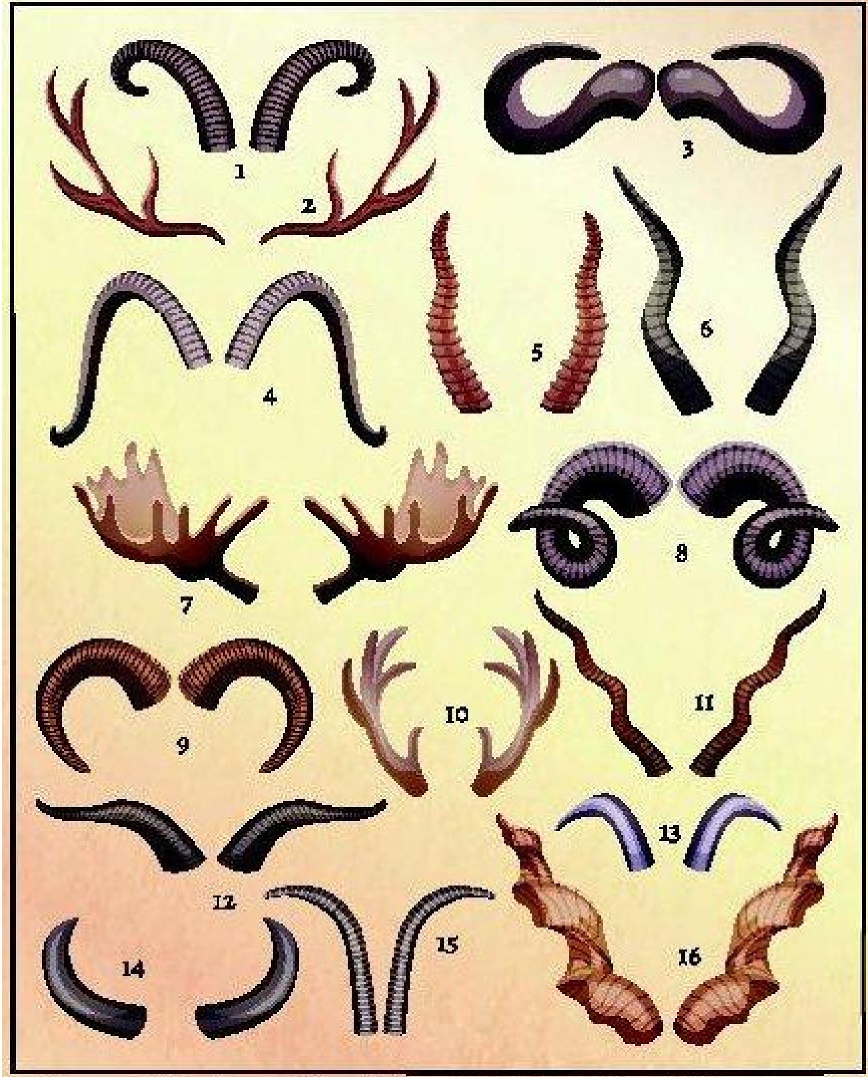
**Monument to
John Ray**
(outside church)



Slab commemorating John Ray
(Unveiled by David Bellamy 11 Oct 1986)

Posters by kind permission of Braintree Museum and the John Ray Trust.

Horns a Plenty



1. Pyrenean Goat. 2. Deer. 3. African Buffalo. 4. Nubian Goat. 5. Saiga. 6. Addax.
7. Moose. 8. Sheep. 9. Moulon. 10. Siberian Deer. 11. Garna. 12. Bharal. 13. Domestic Goat
14. Water Buffalo. 15. Sahara Oryx. 16. Markhor.

Horns are an animal's means of defence or a weapon, so as a symbol they function as representing strength and aggressiveness.
They are also the power and dignity of the divinity.
To have the horn "exalted" denotes prosperity and triumph.

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